

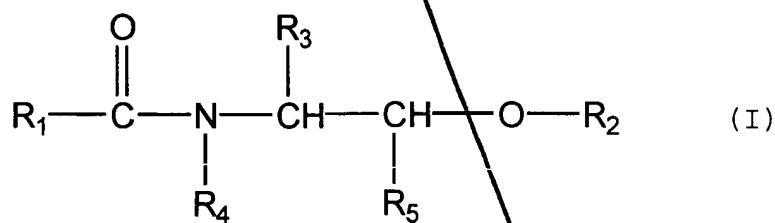
WHAT IS CLAIMED IS:

1. A composition for the protection of keratinous fibers, said composition comprising:

at least one compound chosen from ceramides and glycosceramides,
at least one cationic polymer, and
at least one amphoteric polymer.

2. A composition according to claim 1, wherein said ceramides and glycosceramides are chosen from natural and synthetic ceramides, natural and synthetic glycosceramides, natural and synthetic pseudoceramides and natural and synthetic neoceramides.

3. A composition according to claim 1, wherein said natural and synthetic ceramides and natural and synthetic glycosceramides correspond to the following formula (I):



wherein

- R₁ is chosen from:

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- linear and branched, saturated and unsaturated, C_5-C_{50} hydrocarbon radicals, wherein said radicals may be substituted with at least one hydroxyl group, said at least one hydroxyl group being optionally esterified with an acid R_6COOH wherein R_6 is chosen from saturated and unsaturated, linear and branched C_1-C_{35} hydrocarbon radicals which may be monohydroxylated or polyhydroxylated, and further wherein when said hydrocarbon radicals of R_6 are mono- or polyhydroxylated, said hydroxyl group(s) may be esterified with a compound chosen from saturated and unsaturated, linear and branched C_1-C_{35} fatty acids which may be monohydroxylated or polyhydroxylated,

- $R''-(NR-CO)-R'$ radicals, wherein R is chosen from a hydrogen atom and mono- and polyhydroxylated C_1-C_{20} hydrocarbon radicals, and R' and R'' are chosen from hydrocarbon radicals in which the sum of the carbon atoms ranges from 9 to 30, R' being a divalent radical, and

- $R_7-O-CO-(CH_2)_a$ radicals, wherein R_7 is chosen from C_1-C_{20} hydrocarbon radicals and a is an integer ranging from 1 to 12;

- R_2 is chosen from a hydrogen atom and (glycosyl) $_b$, (galactosyl) $_c$, sulphogalactosyl, phosphorylethylamine and phosphorylethylammonium radicals, wherein b is an integer ranging from 1 to 4 and c is an integer ranging from 1 to 8;

- R_3 is chosen from a hydrogen atom and saturated and unsaturated, hydroxylated and non-hydroxylated C_1-C_{33} hydrocarbon radicals, it being possible for

the hydroxylated hydrocarbon radical(s) to be esterified with an acid chosen from inorganic acids and organic acids of the formula $R_6\text{COOH}$, wherein R_6 is defined above, it also being possible for the hydroxylated hydrocarbon radical(s) to be etherified with a radical chosen from (glycosyl)_b, (galactosyl)_c, sulphogalactosyl, phosphorylethylamine and phosphorylethylammonium radicals, wherein b and c are defined above, and it also being possible for R_3 to be substituted with at least one C_1 - C_{14} alkyl radical;

- R_4 is chosen from a hydrogen atom, methyl radicals, ethyl radicals, saturated and unsaturated, linear and branched, optionally hydroxylated C_3 - C_{50} hydrocarbon radicals and radicals $-\text{CH}_2\text{-CHOH-CH}_2\text{-O-}R_8$ in which R_8 is chosen from C_{10} - C_{26} hydrocarbon radicals and radicals $R_7\text{-O-CO-(CH}_2)_a$, R_7 being chosen from C_1 - C_{20} hydrocarbon radicals and a being an integer ranging from 1 to 12;

- R_5 is chosen from a hydrogen atom and saturated and unsaturated, linear and branched, optionally mono- and polyhydroxylated C_1 - C_{30} hydrocarbon radicals, it being possible for the hydroxyl radical(s) to be etherified with a radical chosen from (glycosyl)_b, (galactosyl)_c, sulphogalactosyl, phosphorylethylamine and phosphorylethylammonium radicals, wherein b and c are defined above;

with the proviso that when R_3 and R_5 are a hydrogen atom or when R_3 is a hydrogen atom and R_5 is a methyl radical, then R_4 is not a hydrogen atom or a methyl or ethyl radical.

4. A composition according to claim 3, wherein in said radicals R'-(NR-CO)-R', R is chosen from monohydroxylated C₁-C₂₀ hydrocarbon radicals.

5. A composition according to claim 3, wherein in said formula (I), R₃ is chosen from C₁₅-C₂₆ α-hydroxyalkyl radicals wherein the hydroxyl group may optionally be esterified with a C₁₆-C₃₀ α-hydroxy acid.

6. A composition according to claim 3, wherein in formula (I), R₁ is an optionally hydroxylated, saturated or unsaturated alkyl radical derived from C₁₄-C₂₂ fatty acids; R₂ is a hydrogen atom; and R₃ is an optionally hydroxylated linear, saturated C₁₁-C₁₇ radical.

7. A composition according to claim 6, wherein R₃ is an optionally hydroxylated linear, saturated C₁₃-C₁₅ radical.

8. A composition according to claim 1, wherein said at least one compound chosen from ceramides and glycosceramides is chosen from:

- N-linoleoyldihydrosphingosine,
- N-oleoyldihydrosphingosine,
- N-palmitoyldihydrosphingosine,
- N-stearoyldihydrosphingosine,
- N-behenoyldihydrosphingosine,
- N-2-hydroxypalmitoyldihydrosphingosine,
- N-stearoylphyto sphingosine,

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- 2-oleamido-1,3-octadecanediol, and
- N-palmitamidohexadecanediol.

9. A composition according to claim 8, wherein said at least one compound chosen from ceramides and glycosceramides is chosen from 2-oleamido-1,3-octadecanediol and N-2-hydroxypalmitoyldihydrosphingosine.

10. A composition according to claim 1, wherein said at least one cationic polymer is chosen from cationic polymers containing monomer units comprising amine groups chosen from primary, secondary, tertiary and quaternary amine groups, wherein said amine groups may either form part of the main polymer chain or can be borne by a side substituent directly linked thereto.

11. A composition according to claim 10, wherein said at least one cationic polymer is chosen from polyamine, polyamino amide and polyquaternary ammonium polymers.

12. A composition according to claim 1, wherein said at least one cationic polymer is chosen from polyquaternium-2, polyquaternium-34, and hexadimethrine chloride.

13. A composition according to claim 1, wherein said at least one amphoteric polymer is chosen from polymers containing at least one unit K and at

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least one unit M, said units K and M being distributed randomly in the polymer chain, wherein

K is chosen from units derived from monomers containing at least one basic nitrogen atom and M is chosen from units derived from acid monomers containing at least one group chosen from carboxylic and sulphonic groups; or

K and M, which may be identical or different, may be chosen from units derived from monomers chosen from carboxybetaine and sulphobetaine zwitterionic monomers; or

K and M, which may be identical or different, may be chosen from cationic polymer chains containing at least one amine group chosen from primary, secondary, tertiary and quaternary amine groups, in which at least one of the amine groups bears a group chosen from carboxylic and sulphonic groups connected to said amine via a hydrocarbon radical; or

K and M form part of a polymer with an α,β -dicarboxylic ethylene unit, in which one of the carboxyl groups has been reacted with a polyamine containing at least one group chosen from primary and secondary amine groups.

14. A composition according to claim 13, wherein said at least one amphoteric polymer is chosen from dialkylaminoalkyl methacrylate, dialkylaminoalkyl

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acrylate, dialkylaminoalkylmethacrylamide and dialkylaminoalkyl acrylamide copolymers and dialkyldiallylammonium salts.

15. A composition according to claim 14, wherein said at least one amphoteric polymer is polyquaternium-22.

16. A composition according to claim 1, wherein said at least one compound chosen from ceramides and glycoceramides is present in the composition in an amount effective for providing improved protection to said keratinous fibers.

17. A composition according to claim 1, wherein said at least one compound chosen from ceramides and glycoceramides is present in said composition in an amount ranging from about 0.0005% to about 2% by weight relative to the total weight of the composition.

18. A composition according to claim 17, wherein said at least one compound chosen from ceramides and glycoceramides is present in said composition in an amount ranging from about 0.001% to about 1% by weight relative to the total weight of the composition.

19. A composition according to claim 1, wherein said at least one cationic polymer is present in the composition in an amount effective to provide improved styling to said keratinous fibers, and further wherein the composition contains at

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least one compound chosen from ceramides and glycoceramides present in an amount effective for providing improved protection to said keratinous fibers.

20. A composition according to claim 1, wherein said at least one cationic polymer is present in said composition in an amount ranging from about 0.01% to about 5% by weight relative to the total weight of the composition.

21. A composition according to claim 20, wherein said at least one cationic polymer is present in said composition in an amount ranging from about 0.05% to about 2% by weight relative to the total weight of the composition.

22. A composition according to claim 1, wherein said at least one amphoteric polymer is present in said composition in an amount effective to provide improved styling to said keratinous fibers, and further wherein the composition contains at least one compound chosen from ceramides and glycoceramides present in an amount effective for providing improved protection to said keratinous fibers.

23. A composition according to claim 1, wherein said at least one amphoteric polymer is present in said composition in an amount ranging from about 0.01% to about 5% by weight relative to the total weight of the composition.

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24. A composition according to claim 23, wherein said at least one amphoteric polymer is present in said composition in an amount ranging from about 0.05% to about 2% by weight relative to the total weight of the composition.

25. A composition according to claim 1, further comprising at least one adjuvant chosen from surfactants chosen from anionic, cationic, nonionic, and amphoteric surfactants; polymers chosen from anionic, nonionic, additional cationic and additional amphoteric polymers; thickeners chosen from inorganic and organic thickeners; antioxidants; stabilizing agents; propellants; sequestering agents; emollients; humectants; fragrances; acidifying and basifying agents; sunscreens; vitamins; essential fatty acids; proteins and protein derivatives; preservatives; and opacifiers.

26. A composition according to claim 1, wherein said composition is in the form of an aqueous emulsion, a gel, a spray, or a hydroalcoholic lotion.

27. A process for protecting keratinous fibers from damage caused by chemical treatment of said keratinous fibers comprising:

applying to said keratinous fibers a leave-in composition comprising at least one compound chosen from ceramides and glycoceramides,

applying to said keratinous fibers having thereon said leave-in composition a chemical treatment composition for chemical treatment of said keratinous fibers.

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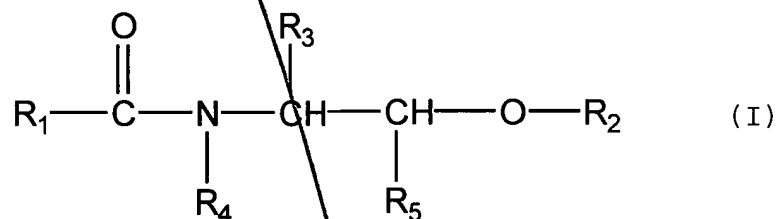
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28. A process according to claim 27, wherein said chemical treatment is chosen from dyeing, bleaching, relaxing, and permanent waving.

29. A process according to claim 27, wherein said ceramides and glycosceramides are chosen from natural or synthetic ceramides, glycosceramides, pseudoceramides and neoceramides.

30. A process according to claim 29, wherein said natural or synthetic ceramides and glycosceramides correspond to the following formula (I):



wherein

- R_1 is chosen from:

- linear and branched, saturated and unsaturated, C_5 - C_{50} hydrocarbon radicals, wherein said radicals may be substituted with at least one hydroxyl group, said at least one hydroxyl group being optionally esterified with an acid R_6COOH wherein R_6 is chosen from saturated and unsaturated, linear and branched C_1 - C_{35} hydrocarbon radicals which may be monohydroxylated or polyhydroxylated, and further wherein when said hydrocarbon radicals of R_6 are mono- or polyhydroxylated, said hydroxyl group(s) may be esterified with a compound chosen

from saturated and unsaturated, linear and branched C_1-C_{35} fatty acids which may be monohydroxylated or polyhydroxylated,

- $R''-(NR-CO)-R'$ radicals, wherein R is chosen from a hydrogen atom and mono- and polyhydroxylated C_1-C_{20} hydrocarbon radicals, and R' and R'' are chosen from hydrocarbon radicals in which the sum of the carbon atoms ranges from 9 to 30, R' being a divalent radical, and

- $R_7-O-CO-(CH_2)_a$ radicals, wherein R_7 is chosen from C_1-C_{20} hydrocarbon radicals and a is an integer ranging from 1 to 12;

- R_2 is chosen from a hydrogen atom and (glycosyl)_b, (galactosyl)_c, sulphogalactosyl, phosphorylethylamine and phosphorylethylammonium radicals, wherein b is an integer ranging from 1 to 4 and c is an integer ranging from 1 to 8;

- R_3 is chosen from a hydrogen atom and saturated and unsaturated, hydroxylated and non-hydroxylated C_1-C_{33} hydrocarbon radicals, it being possible for the hydroxylated hydrocarbon radical(s) to be esterified with an acid chosen from inorganic acids and organic acids of the formula R_6COOH , wherein R_6 is defined above, it also being possible for the hydroxylated hydrocarbon radical(s) to be etherified with a radical chosen from (glycosyl)_b, (galactosyl)_c, sulphogalactosyl, phosphorylethylamine and phosphorylethylammonium radicals, wherein b and c are defined above, and it also being possible for R_3 to be substituted with at least one C_1-C_{14} alkyl radical;

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- R_4 is chosen from a hydrogen atom, methyl radicals, ethyl radicals, saturated and unsaturated, linear and branched, optionally hydroxylated C_3 - C_{50} hydrocarbon radicals and radicals $-CH_2-CHOH-CH_2-O-R_8$ in which R_8 is chosen from C_{10} - C_{26}

hydrocarbon radicals and radicals $R_7-O-CO-(CH_2)_a$, R_7 being chosen from C_1 - C_{20} hydrocarbon radicals and a being an integer ranging from 1 to 12;

- R_5 is chosen from a hydrogen atom and saturated and unsaturated, linear and branched, optionally mono- and polyhydroxylated C_1 - C_{30} hydrocarbon radicals, it being possible for the hydroxyl radical(s) to be etherified with a radical chosen from (glycosyl)_b, (galactosyl)_c, sulphogalactosyl, phosphorylethylamine and phosphorylethylammonium radicals, wherein b and c are defined above;

with the proviso that when R_3 and R_5 are a hydrogen atom or when R_3 is a hydrogen atom and R_5 is a methyl radical, then R_4 is not a hydrogen atom or a methyl or ethyl radical.

31. A process according to claim 30, wherein in said radicals $R''-(NR-CO)-R'$, R is chosen from monohydroxylated C_1 - C_{20} hydrocarbon radicals.

32. A process according to claim 30, wherein in said formula (I), R_3 is chosen from C_{15} - C_{26} α -hydroxyalkyl radicals wherein the hydroxyl group may optionally be esterified with a C_{16} - C_{30} α -hydroxy acid.

33. A process according to claim 30, wherein in formula (I), R_1 is an optionally hydroxylated, saturated or unsaturated alkyl radical derived from C_{14} - C_{22}

fatty acids; R_2 is a hydrogen atom; and R_3 is an optionally hydroxylated linear, saturated C_{11} - C_{17} radical.

34. A process according to claim 33, wherein R_3 is an optionally hydroxylated linear, saturated C_{13} - C_{15} radical.

35. A process according to claim 27, wherein said at least one compound chosen from ceramides and glycosceramides is chosen from:

- N-linoleoyldihydrosphingosine,
- N-oleoyldihydrosphingosine,
- N-palmitoyldihydrosphingosine,
- N-stearoyldihydrosphingosine,
- N-behenoyldihydrosphingosine,
- N-2-hydroxypalmitoyldihydrosphingosine,
- N-stearoylphytoosphingosine,
- 2-oleamido-1,3-octadecanediol, and
- N-palmitamidohexadecanediol.

36. A process according to claim 35, wherein said at least one compound chosen from ceramides and glycosceramides is chosen from 2-oleamido-1,3-octadecanediol and N-2-hydroxypalmitoyldihydrosphingosine.

37. A process according to claim 27, wherein said leave-in composition further comprises at least one polymer chosen from at least one cationic polymer and at least one amphoteric polymer.

38. A process according to claim 37, wherein said at least one cationic polymer is chosen from cationic polymers containing monomer units comprising amine groups chosen from primary, secondary, tertiary and quaternary amine groups, wherein said amine groups may either form part of the main polymer chain or can be borne by a side substituent directly linked thereto.

39. A process according to claim 38, wherein said at least one cationic polymer is chosen from polyamine, polyamino amide and polyquaternary ammonium polymers.

40. A process according to claim 39, wherein said at least one cationic polymer is chosen from polyquaternium-2, polyquaternium-34, and hexadimethrine chloride.

41. A process according to claim 37, wherein said at least one amphoteric polymer is chosen from polymers containing at least one unit K and at least one unit M, said units K and M being distributed randomly in the polymer chain, wherein

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K is chosen from units derived from monomers containing at least one basic nitrogen atom and M is chosen from units derived from acid monomers containing at least one group chosen from carboxylic and sulphonic groups; or

K and M, which may be identical or different, may be chosen from units derived from monomers chosen from carboxybetaine and sulphobetaine zwitterionic monomers; or

K and M, which may be identical or different, may be chosen from cationic polymer chains containing at least one amine group chosen from primary, secondary, tertiary and quaternary amine groups, in which at least one of the amine groups bears a group chosen from carboxylic and sulphonic groups connected to said amine via a hydrocarbon radical; or

K and M form part of a polymer with an α,β -dicarboxylic ethylene unit, in which one of the carboxyl groups has been reacted with a polyamine containing at least one group chosen from primary and secondary amine groups.

42. A process according to claim 41, wherein said at least one amphoteric polymer is chosen from dialkylaminoalkyl methacrylate, dialkylaminoalkyl acrylate, dialkylaminoalkylmethacrylamide and dialkylaminoalkyl acrylamide copolymers and dialkyldiallylammonium salts.

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43. A process according to claim 42, wherein said at least one amphoteric polymer is polyquaternium-22.

44. A process according to claim 27, wherein said at least one compound wherein chosen from ceramides and glycoceramides is present in the composition in an amount effective for providing improved protection to said keratinous fibers.

45. A process according to claim 27, wherein said at least one compound chosen from ceramides and glycoceramides is present in said composition in an amount ranging from about 0.0005% to about 2% by weight relative to the total weight of the composition.

46. A process according to claim 27, wherein said at least one cationic polymer is present in the composition in an amount effective to provide improved styling to said keratinous fibers, and further wherein the composition contains at least one compound chosen from ceramides and glycoceramides present in an amount effective for providing improved protection to said keratinous fibers.

47. A process according to claim 27, wherein said at least one cationic polymer is present in said composition in an amount ranging from about 0.01 to about 5% by weight relative to the total weight of the composition.

48. A process according to claim 27, wherein said at least one amphoteric polymer is present in said composition in an amount effective to provide improved

styling to said keratinous fibers, and further wherein the composition contains at least one compound chosen from ceramides and glycoceramides present in an amount effective for providing improved protection to said keratinous fibers.

49. A process according to claim 27, wherein said at least one amphoteric polymer is present in said composition in an amount ranging from about 0.01 to about 5% by weight relative to the total weight of the composition.

50. A multi-compartment kit for chemical treatment of keratinous fibers, said kit comprising at least two separate compartments, wherein

a first compartment contains a composition comprising at least one compound chosen from ceramides and glycoceramides, and

a second compartment contains a composition for chemical treatment of said keratinous fibers.

51. A multi-compartment kit according to claim 50, wherein said composition for chemical treatment of keratinous fibers is chosen from a dyeing composition, a bleaching composition, a permanent waving composition, and a relaxing composition.

52. A multi-compartment kit according to claim 51, wherein said composition comprising at least one compound chosen from ceramides and

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glycoceramides further comprises at least one polymer chosen from at least one cationic polymer and at least one amphoteric polymer.

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